



# ComEd Rural Small Business Energy Efficiency Kits Impact Evaluation Report

Energy Efficiency / Demand Response Plan:  
Program Year 2018 (CY2018)  
(1/1/2018-12/31/2018)

Presented to  
ComEd

DRAFT

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**Prepared by:**

Kyle McKenna  
EcoMetric Consulting

Mike Frischmann  
EcoMetric Consulting

Christy Zook  
Navigant Consulting

Sagar Deo  
Navigant Consulting

Palak Thakur  
Navigant Consulting



[www.navigant.com](http://www.navigant.com)

**Submitted to:**

ComEd  
Three Lincoln Centre  
Oakbrook Terrace, IL 60181

**Submitted by:**

Navigant Consulting, Inc.  
150 N. Riverside Plaza, Suite 2100  
Chicago, IL 60606

**Contact:**

Randy Gunn, Managing Director  
312.583.5714  
Randy.Gunn@Navigant.com

Jeff Erickson, Director  
608.497.2322  
Jeff.Erickson@Navigant.com

Rob Neumann, Associate Director  
312.583.2176  
Rob.Neumann@Navigant.com

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## 1. INTRODUCTION

This report presents the results of the impact evaluation of ComEd’s CY2018 Rural Small Business Energy Efficiency Kits (Rural SBEEK) Program. It presents a summary of the energy and demand impacts for the total program and broken out by relevant measure and program structure details. Appendix 1 presents the impact analysis methodology. CY2018 covers January 1, 2018 through December 31, 2018.

## 2. PROGRAM DESCRIPTION

This program aims to cost-effectively capture electric savings in ComEd’s rural counties by targeting customers that operate small office, restaurant, or other facilities with electric hot water and building heating. This is an opt-in program where customers must request to receive an energy efficiency kit that includes self-install measures. The measures included in the energy efficiency kit depend on the type of facility the customer ordering the kit operates.

To participate in the program, the ComEd customer must have a peak electric load of 100 kW or below, take delivery from ComEd regardless of their choice of electric supplier, and cannot have participated in the current ComEd Small Business Energy Savings Program. Franklin Energy (Franklin) implements the program, which delivers kits by direct mail. Customers can order a kit via a telephone call, mail a reply card, or email a request. Resource Action Programs (RAP), a Franklin Energy company, creates and ships the small business energy efficiency kits directly to the customer facilities. The kits contain products particularly selected for the specific business types as well as detailed installation instructions. A customer service representative follows up with a sample of customers within three weeks of energy kit receipt to verify that the customer received the kit, confirm what measures have been installed or the customer’s plans to install the measures, answer any questions the customer may have about the measures or program, and determine customer satisfaction with the program.

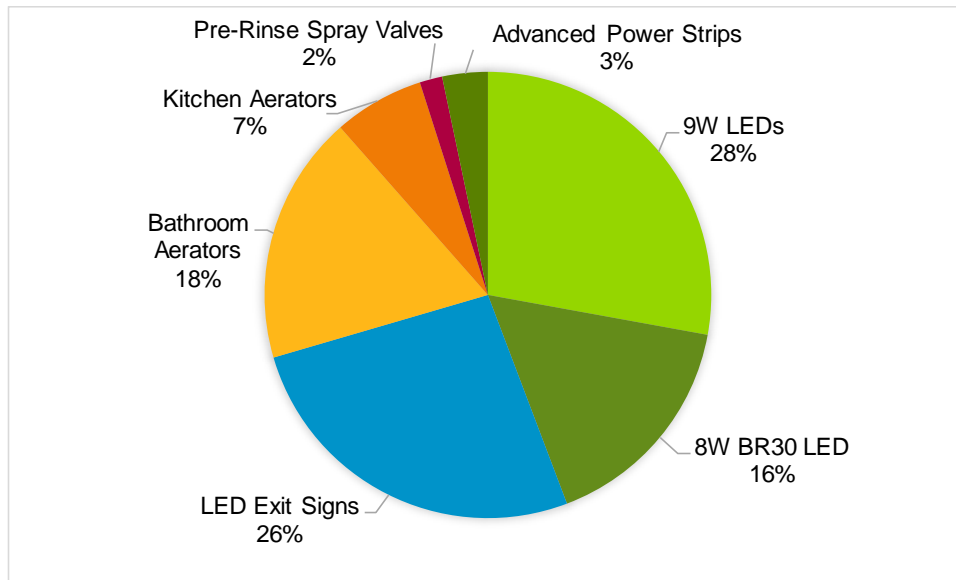
The energy efficiency kits included a combination of LED bulbs, faucet aerators, pre-rinse spray valves, and advanced power strips. The program had 4,012 participants in CY2018 and distributed 30,591 measures as shown in Table 2-1 and Figure 2-1.

**Table 2-1. CY2018 Volumetric Findings Detail**

Participation	Small Offices	Other Stores	Restaurants	Total
Number of Measures/Kit	5	4	5	
Number of Total Kits Distributed	1,007	2,505	500	4,012
Number of 9W LEDs Distributed	2,014	5,010	1,500	8,524
Number of BR30 8W LEDs	0	5,010	0	5,010
Number of LED Exit Signs Distributed	2,014	5,010	1,000	8,024
Number of Bathroom Aerators Distributed	2,014	2,505	1,000	5,519
Number of Kitchen Aerators Distributed	1,007	0	1,000	2,007
Number of Pre-Rinse Spray Valves Distributed	0	0	500	500
Number of Advanced Smart Strips Distributed	1,007	0	0	1,007
Number of Total Measure Distributed	8,056	17,535	5,000	30,591

Source: ComEd tracking data and Navigant team analysis.

**Figure 2-1. Number of Measures Installed by Type**



Source: ComEd tracking data and Navigant team analysis.

### 3. CUMULATIVE PERSISTING ANNUAL SAVINGS

The measure-specific and total verified gross savings for the Rural SBEEK Program and the cumulative persisting annual savings (CPAS) for the measures installed in CY2018 are shown in the following tables and figure. The total CPAS across all measures is 1,797,464 kWh. The program achieved 1,196,123 kWh CPAS equivalent of gas savings converted to electricity that might be counted towards ComEd’s goal<sup>1</sup> (the middle table in the following set of tables). Adding the savings converted from gas savings to the electric savings produces a total of 2,993,587 net kWh of total CPAS.

The ex ante savings did not include an estimate for carryover savings from light bulbs distributed in PY9 but installed in CY2018. The Navigant team included an estimate for PY9 carryover into CY2018 in the CPAS shown in Table 3-1 through Table 3-3 below.

The evaluation team applied the Energy Independence and Security Act (EISA) baseline for LED lamps starting in 2021. The EISA baseline shift only applies to LED omnidirectional bulbs and not to BR30 directional bulbs or LED exit signs. Beginning in 2021 the LED baseline shifts from 29 watts to 11.8 watts for LED lamps included in the kits.

The evaluation team used measure-specific custom in-service rates (ISR) to calculate verified energy savings for the Rural SBEEK Program. Navigant calculated the ISRs using survey response data provided by Franklin. Franklin selected a random sample of customers who received a kit and targeted them for a follow-up phone survey. Franklin compiled the customer responses and provided them to the evaluation team with the remainder of the end of year data.

Franklin used the ISRs from the residential section of the IL TRM v6.0 to determine the CY2018 ex ante savings since the survey responses were not available at the time the ex ante calculations were performed. During the wave 1 analysis, the Navigant team used the TRM ISRs as well due to a very small

<sup>1</sup> The evaluation will determine which gas savings will be counted toward goal while producing the portfolio-wide Summary Report.

number of survey responses received to date. However, Navigant indicated that custom ISRs would be used if enough data was available at the close of CY2018<sup>2</sup>.

The CY2018 custom ISRs are less than the ISRs found during the PY9 evaluation<sup>3</sup> for all measures. Similarly, the CY2018 custom ISRs are less than the values shown in the residential section of the IL TRM v6.0, which is being used in the ex ante calculations, for each measure with the exception of the 9W LED lamps in the Other/General kit. The lower ISRs are the largest reason for lower verified energy savings when compared to the ex ante savings.

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<sup>2</sup> ComEd Rural Small Business Kits Program Wave 1 Data Review and Analysis. Navigant Consulting, December 12, 2018.

<sup>3</sup> ComEd Rural Small Business Energy Efficiency Kits IPA Program Impact Evaluation Report. Navigant Consulting, August 1, 2018.

**Table 3-1. Cumulative Persisting Annual Savings (CPAS) – Electric**

End Use Type	Research Category	CY2018 Verified				Verified Net kWh Savings									
		EUL	Gross Savings	NTG*	Lifetime Net Savings†	2018	2019	2020	2021	2022	2023	2024	2025	2026	
Lighting	9.0-watt LED - Small Office	15	72,667	0.90	306,073	65,400	65,400	65,400	9,156	9,156	9,156	9,156	9,156	9,156	
Lighting	9.0-watt LED - Restaurant	10	94,825	0.90	339,661	85,342	85,342	85,342	11,948	11,948	11,948	11,948	11,948	11,948	
Lighting	9.0-watt LED - Other General	17	264,912	0.90	1,182,566	238,421	238,421	238,421	33,379	33,379	33,379	33,379	33,379	33,379	
Lighting	BR30 LED - Other General	17	451,796	0.90	6,912,473	406,616	406,616	406,616	406,616	406,616	406,616	406,616	406,616	406,616	
Lighting	Exit Sign LED - Small Office	16	97,878	0.90	1,409,440	88,090	88,090	88,090	88,090	88,090	88,090	88,090	88,090	88,090	
Lighting	Exit Sign LED - Restaurant	16	59,828	0.90	861,522	53,845	53,845	53,845	53,845	53,845	53,845	53,845	53,845	53,845	
Lighting	Exit Sign LED - Other General	16	422,861	0.90	6,089,201	380,575	380,575	380,575	380,575	380,575	380,575	380,575	380,575	380,575	
Hot Water	Bathroom Aerator (1.0 GPM) - Small Office	9	7,063	0.90	57,212	6,357	6,357	6,357	6,357	6,357	6,357	6,357	6,357	6,357	
Hot Water	Bathroom Aerator (1.0 GPM) - Restaurant	9	25,483	0.90	206,410	22,934	22,934	22,934	22,934	22,934	22,934	22,934	22,934	22,934	
Hot Water	Bathroom Aerator (1.0 GPM) - Other General	9	20,937	0.90	169,589	18,843	18,843	18,843	18,843	18,843	18,843	18,843	18,843	18,843	
Hot Water	Kitchen Aerator (1.5 GPM) - Small Office	9	4,305	0.90	34,867	3,874	3,874	3,874	3,874	3,874	3,874	3,874	3,874	3,874	
Hot Water	Kitchen Aerator (1.5 GPM) - Restaurant	9	28,743	0.90	232,815	25,868	25,868	25,868	25,868	25,868	25,868	25,868	25,868	25,868	
Hot Water	Pre-rinse Spray Valve - Restaurant	5	104,282	0.90	469,271	93,854	93,854	93,854	93,854	93,854					
Consumer Electronics	Advanced Smart Strip - Tier 1 - Small Office	7	66,755	0.90	420,557	60,080	60,080	60,080	60,080	60,080	60,080	60,080			
Carryover	PY9 Carryover	106	274,849	0.90	1,232,120	247,364	247,364	184,994	119,214	119,214	119,214	27,712	27,712	26,618	
<b>CY2018 Program Total Electric CPAS</b>			<b>1,997,182</b>		<b>19,923,776</b>	<b>1,797,464</b>	<b>1,797,464</b>	<b>1,735,094</b>	<b>1,334,633</b>	<b>1,334,633</b>	<b>1,240,779</b>	<b>1,149,277</b>	<b>1,089,198</b>	<b>1,088,104</b>	
<b>CY2018 Program Expiring Electric Savings†</b>									<b>400,461</b>	<b>400,461</b>	<b>494,315</b>	<b>585,817</b>	<b>645,896</b>	<b>646,990</b>	

End Use Type	Research Category	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
Lighting	9.0-watt LED - Small Office	9,156	9,156	9,156	9,156	9,156	9,156						
Lighting	9.0-watt LED - Restaurant	11,948											
Lighting	9.0-watt LED - Other General	33,379	33,379	33,379	33,379	33,379	33,379	33,379	33,379				
Lighting	BR30 LED - Other General	406,616	406,616	406,616	406,616	406,616	406,616	406,616	406,616				
Lighting	Exit Sign LED - Small Office	88,090	88,090	88,090	88,090	88,090	88,090	88,090					
Lighting	Exit Sign LED - Restaurant	53,845	53,845	53,845	53,845	53,845	53,845	53,845					
Lighting	Exit Sign LED - Other General	380,575	380,575	380,575	380,575	380,575	380,575	380,575					
Hot Water	Bathroom Aerator (1.0 GPM) - Small Office												
Hot Water	Bathroom Aerator (1.0 GPM) - Restaurant												
Hot Water	Bathroom Aerator (1.0 GPM) - Other General												
Hot Water	Kitchen Aerator (1.5 GPM) - Small Office												
Hot Water	Kitchen Aerator (1.5 GPM) - Restaurant												
Hot Water	Pre-rinse Spray Valve - Restaurant												
Consumer Electronics	Advanced Smart Strip- Tier 1 - Small Office												
Carryover	PY9 Carryover	26,000	26,000	26,000	25,473	9,243							
<b>CY2018 Program Total Electric CPAS</b>		<b>1,009,609</b>	<b>997,661</b>	<b>997,661</b>	<b>997,134</b>	<b>980,904</b>	<b>971,661</b>	<b>962,505</b>	<b>439,995</b>				
<b>CY2018 Program Expiring Electric Savings†</b>		<b>725,485</b>	<b>737,433</b>	<b>737,433</b>	<b>737,960</b>	<b>754,190</b>	<b>763,433</b>	<b>772,589</b>	<b>1,295,099</b>	<b>1,735,094</b>	<b>1,735,094</b>	<b>1,735,094</b>	<b>1,735,094</b>

Note: The green highlighted cell shows program total first year electric savings.

\* A deemed value. Source: ComEd\_NTG\_History\_and\_PY10\_Recommendations\_2017-03-01.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>.

† Lifetime savings are the sum of CPAS savings through the EUL.

‡ Expiring savings are equal to CPAS Yn-1 - CPAS Yn + Expiring Savings Yn-1.

§ This is the weighted average EUL for all the lamps included in the carryover calculations from PY9. The PY9 carryover savings do not expire until 2031

Source: Navigant analysis



**Table 3-2. Cumulative Persisting Annual Savings (CPAS) – Gas**

End Use Type	Research Category	EUL	CY2018 Verified Gross Savings (Therms)	NTG*	Lifetime Net Savings†	Verified Net Therms Savings											
						2018	2019	2020	2021	2022	2023	2024	2025	2026			
Lighting	9.0-watt LED - Small Office	15	-	0.9	-												
Lighting	9.0-watt LED - Restaurant	10	-	0.9	-												
Lighting	9.0-watt LED - Other General	17	-	0.9	-												
Lighting	BR30 LED - Other General	17	-	0.9	-												
Lighting	Exit Sign LED - Small Office	16	-	0.9	-												
Lighting	Exit Sign LED - Restaurant	16	-	0.9	-												
Lighting	Exit Sign LED - Other General	16	-	0.9	-												
Hot Water	Bathroom Aerator (1.0 GPM) - Small Office	9	1,852	0.9	14,999	1,667	1,667	1,667	1,667	1,667	1,667	1,667	1,667	1,667	1,667	1,667	1,667
Hot Water	Bathroom Aerator (1.0 GPM) - Restaurant	9	6,681	0.9	54,114	6,013	6,013	6,013	6,013	6,013	6,013	6,013	6,013	6,013	6,013	6,013	6,013
Hot Water	Bathroom Aerator (1.0 GPM) - Other General	9	5,489	0.9	44,461	4,940	4,940	4,940	4,940	4,940	4,940	4,940	4,940	4,940	4,940	4,940	4,940
Hot Water	Kitchen Aerator (1.5 GPM) - Small Office	9	1,129	0.9	9,143	1,016	1,016	1,016	1,016	1,016	1,016	1,016	1,016	1,016	1,016	1,016	1,016
Hot Water	Kitchen Aerator (1.5 GPM) - Restaurant	9	7,537	0.9	61,051	6,783	6,783	6,783	6,783	6,783	6,783	6,783	6,783	6,783	6,783	6,783	6,783
Hot Water	Pre-rinse Spray Valve- Restaurant	5	22,656	0.9	101,953	20,391	20,391	20,391	20,391	20,391							
Consumer Electronics	Advanced Smart Strip- Tier 1 - Small Office	7	-	0.9	-												
Carryover	PY9 Carryover	10	-	0.9	-												
<b>CY2018 Program Total Gas CPAS (Therms)</b>			<b>45,344</b>		<b>285,722</b>	<b>40,809</b>	<b>40,809</b>	<b>40,809</b>	<b>40,809</b>	<b>40,809</b>	<b>20,419</b>	<b>20,419</b>	<b>20,419</b>	<b>20,419</b>	<b>20,419</b>	<b>20,419</b>	<b>20,419</b>
<b>CY2018 Program Total Gas CPAS (kWh Equivalent)‡</b>			<b>1,329,026</b>		<b>8,374,510</b>	<b>1,196,123</b>	<b>1,196,123</b>	<b>1,196,123</b>	<b>1,196,123</b>	<b>1,196,123</b>	<b>598,473</b>	<b>598,473</b>	<b>598,473</b>	<b>598,473</b>	<b>598,473</b>	<b>598,473</b>	<b>598,473</b>
<b>CY2018 Program Expiring Gas Savings (Therms)§</b>											<b>20,391</b>	<b>20,391</b>	<b>20,391</b>	<b>20,391</b>	<b>20,391</b>	<b>20,391</b>	<b>20,391</b>
<b>CY2018 Program Expiring Gas Savings (kWh Equivalent)‡§</b>											<b>597,650</b>	<b>597,650</b>	<b>597,650</b>	<b>597,650</b>	<b>597,650</b>	<b>597,650</b>	<b>597,650</b>

Note: The green highlighted cell shows program total first year gas savings in kWh equivalents.

\* A deemed value. Source: ComEd\_NTG\_History\_and\_PY10\_Recommendations\_2017-03-01.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>.

† Lifetime savings are the sum of CPAS savings through the EUL.

‡ kWh equivalent savings are calculated by multiplying therm savings by 29.31.

§ Expiring savings are equal to CPAS Yn-1 - CPAS Yn + Expiring Savings Yn-1.

Source: Navigant analysis

**Table 3-3. Cumulative Persisting Annual Savings (CPAS) – Total**

End Use Type	Research Category	CY2018 Verified				Lifetime Net Savings†	Verified Net kWh Savings (Including Those Converted from Gas Savings)									
		EUL	Gross Savings	NTG*			2018	2019	2020	2021	2022	2023	2024	2025	2026	
Lighting	9.0-watt LED - Small Office	15	72,667	0.9	306,073	65,400	65,400	65,400	9,156	9,156	9,156	9,156	9,156	9,156		
Lighting	9.0-watt LED - Restaurant	10	94,825	0.9	339,661	85,342	85,342	85,342	11,948	11,948	11,948	11,948	11,948	11,948		
Lighting	9.0-watt LED - Other General	17	264,912	0.9	1,182,566	238,421	238,421	238,421	33,379	33,379	33,379	33,379	33,379	33,379		
Lighting	BR30 LED - Other General	17	451,796	0.9	6,912,473	406,616	406,616	406,616	406,616	406,616	406,616	406,616	406,616	406,616		
Lighting	Exit Sign LED - Small Office	16	97,878	0.9	1,409,440	88,090	88,090	88,090	88,090	88,090	88,090	88,090	88,090	88,090		
Lighting	Exit Sign LED - Restaurant	16	59,828	0.9	861,522	53,845	53,845	53,845	53,845	53,845	53,845	53,845	53,845	53,845		
Lighting	Exit Sign LED - Other General	16	422,861	0.9	6,089,201	380,575	380,575	380,575	380,575	380,575	380,575	380,575	380,575	380,575		
Hot Water	Bathroom Aerator (1.0 GPM) - Small Office	9	61,339	0.9	496,843	55,205	55,205	55,205	55,205	55,205	55,205	55,205	55,205	55,205		
Hot Water	Bathroom Aerator (1.0 GPM) - Restaurant	9	221,296	0.9	1,792,501	199,167	199,167	199,167	199,167	199,167	199,167	199,167	199,167	199,167		
Hot Water	Bathroom Aerator (1.0 GPM) - Other General	9	181,820	0.9	1,472,740	163,638	163,638	163,638	163,638	163,638	163,638	163,638	163,638	163,638		
Hot Water	Kitchen Aerator (1.5 GPM) -Small Office	9	37,389	0.9	302,854	33,650	33,650	33,650	33,650	33,650	33,650	33,650	33,650	33,650		
Hot Water	Kitchen Aerator (1.5 GPM) -Restaurant	9	249,656	0.9	2,022,214	224,690	224,690	224,690	224,690	224,690	224,690	224,690	224,690	224,690		
Hot Water	Pre-rinse Spray Valve- Restaurant	5	768,338	0.9	3,457,522	691,504	691,504	691,504	691,504	691,504	691,504	691,504	691,504	691,504		
Consumer Electronics	Advanced Smart Strip- Tier 1 - Small Office	7	66,755	0.9	420,557	60,080	60,080	60,080	60,080	60,080	60,080	60,080	60,080	60,080		
Carryover	PY9 Carryover	10§	274,849	0.9	1,232,120	247,364	247,364	184,994	119,214	119,214	119,214	27,712	27,712	26,618		
<b>CY2018 Program Total CPAS</b>			<b>3,326,208</b>		<b>28,298,287</b>	<b>2,993,587</b>	<b>2,993,587</b>	<b>2,931,218</b>	<b>2,530,757</b>	<b>2,530,757</b>	<b>1,839,252</b>	<b>1,747,751</b>	<b>1,687,671</b>	<b>1,686,577</b>		
<b>CY2018 Program Expiring Savings‡</b>									<b>400,461</b>	<b>400,461</b>	<b>1,091,965</b>	<b>1,183,467</b>	<b>1,243,546</b>	<b>1,244,640</b>		

End Use Type	Research Category	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
Lighting	9.0-watt LED - Small Office	9,156	9,156	9,156	9,156	9,156	9,156						
Lighting	9.0-watt LED - Restaurant	11,948											
Lighting	9.0-watt LED - Other General	33,379	33,379	33,379	33,379	33,379	33,379	33,379	33,379				
Lighting	BR30 LED - Other General	406,616	406,616	406,616	406,616	406,616	406,616	406,616	406,616				
Lighting	Exit Sign LED - Small Office	88,090	88,090	88,090	88,090	88,090	88,090	88,090					
Lighting	Exit Sign LED - Restaurant	53,845	53,845	53,845	53,845	53,845	53,845	53,845					
Lighting	Exit Sign LED - Other General	380,575	380,575	380,575	380,575	380,575	380,575	380,575					
Hot Water	Bathroom Aerator (1.0 GPM) - Small Office												
Hot Water	Bathroom Aerator (1.0 GPM) - Restaurant												
Hot Water	Bathroom Aerator (1.0 GPM) - Other General												
Hot Water	Kitchen Aerator (1.5 GPM) -Small Office												
Hot Water	Kitchen Aerator (1.5 GPM) -Restaurant												
Hot Water	Pre-rinse Spray Valve- Restaurant												
Consumer Electronics	Advanced Smart Strip- Tier 1 - Small Office												
Carryover	PY9 Carryover	26,000	26,000	26,000	25,473	9,243							
<b>CY2018 Program Total CPAS</b>		<b>1,009,609</b>	<b>997,661</b>	<b>997,661</b>	<b>997,134</b>	<b>980,904</b>	<b>971,661</b>	<b>962,505</b>	<b>439,995</b>				
<b>CY2018 Program Expiring Savings‡</b>		<b>1,921,609</b>	<b>1,933,557</b>	<b>1,933,557</b>	<b>1,934,083</b>	<b>1,950,313</b>	<b>1,959,556</b>	<b>1,968,712</b>	<b>2,491,223</b>	<b>2,931,218</b>	<b>2,931,218</b>	<b>2,931,218</b>	<b>2,931,218</b>

Note: The green highlighted cell shows program total first year electric savings (including direct electric savings and those converted from gas).

\* A deemed value. Source: ComEd\_NTG\_History\_and\_PY10\_Recommendations\_2017-03-01.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>.

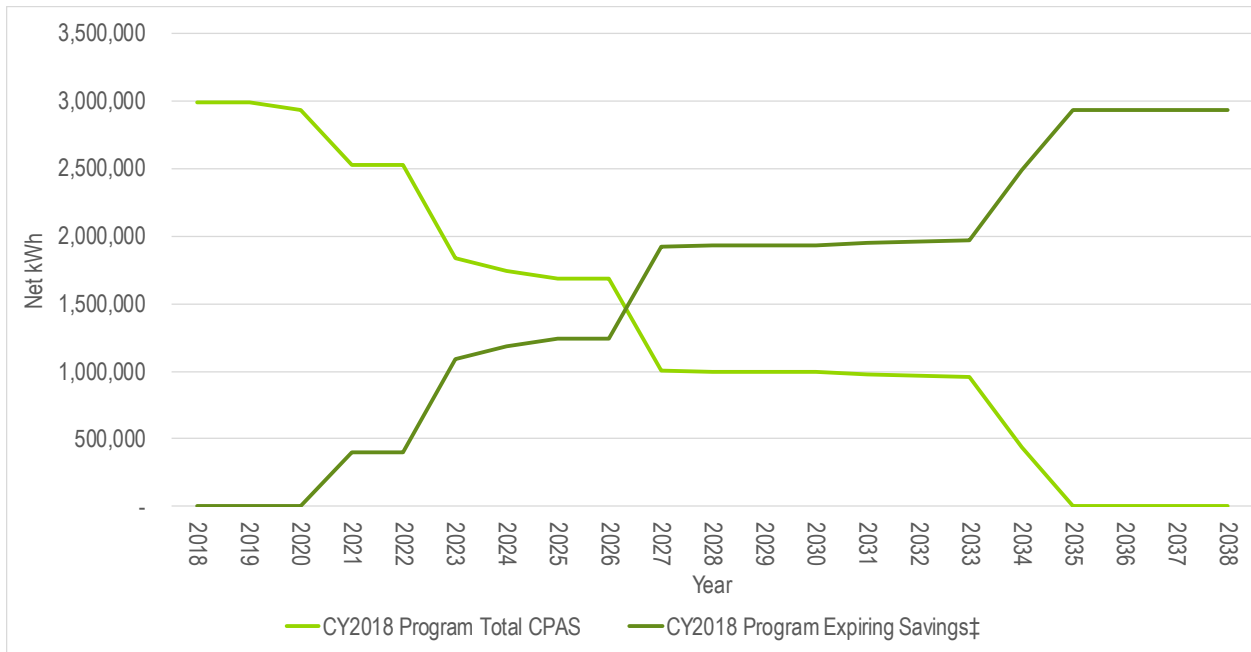
†Lifetime savings are the sum of CPAS savings through the EUL.

‡ Expiring savings are equal to CPAS Yn-1 - CPAS Yn + Expiring Savings Yn-1.

§ This is the weighted average EUL for all the lamps included in the carryover calculations from PY9. The PY9 carryover savings do not expire until 2031

Source: Navigant analysis

Figure 3-1. Cumulative Persisting Annual Savings



‡ Expiring savings are equal to CPAS Yn-1 - CPAS Yn + Expiring Savings Yn-1.  
Source: Navigant analysis

#### 4. PROGRAM SAVINGS DETAIL

Table 4-1 summarizes the incremental energy and demand savings the Rural SBEEK Program achieved in CY2018. The gas savings are only those that the gas utilities are not claiming and ComEd can claim.<sup>4</sup> The ex ante and verified savings in Table 4-1 also include carryover savings from PY9 as a separate line item.

<sup>4</sup> The evaluation will determine which gas savings will be counted toward goal while producing the portfolio-wide Summary Report.

**Table 4-1. CY2018 Total Annual Incremental Electric Savings**

Savings Category	Energy Savings (kWh)	Demand Savings (kW)	Summer Peak Demand Savings (kW)
<b>Electricity</b>			
Ex Ante Gross Savings	2,648,524	NR	377
Program Gross Realization Rate†	0.65	NA	0.82
Verified Gross Savings	1,722,333	1,753	308
Program Net-to-Gross (NTG) Ratio	0.90	0.90	0.90
PY9 Verified Net Carryover Savings	247,364	95	57
Total Verified Net Savings including Carryover	1,797,464	1,672	335
<b>Converted from Gas*</b>			
Ex Ante Gross Savings	2,866,012	NA	NA
Program Gross Realization Rate	0.46	NA	NA
Verified Gross Savings	1,329,026	NA	NA
Program Net-to-Gross (NTG) Ratio	0.90	NA	NA
Verified Net Savings	1,196,123	NA	NA
<b>Total Electric Plus Gas</b>			
Ex Ante Gross Savings	5,514,536	NR	377
Program Gross Realization Rate†	0.55	NA	0.82
Verified Gross Savings	3,051,359	1,753	308
Program Net-to-Gross (NTG) Ratio	0.90	0.90	0.90
PY9 Verified Net Carryover Savings	247,364	95	57
Total Verified Net Savings including Carryover	2,993,587	1,672	335

†The verified gross realization rate does not include carryover savings.

\* Gas savings converted to kWh by multiplying therms \* 29.31 (which is based on 100,000 Btu/therm and 3,412 Btu/kWh).

Note: The coincident Summer Peak period is defined as 1:00-5:00 PM Central Prevailing Time on non-holiday weekdays, June through August.

NR = Not Reported

NA = Not Applicable

Source: ComEd tracking data and Navigant team analysis.

## 5. PROGRAM SAVINGS BY MEASURE

The Navigant team’s analysis of the ComEd CY2018 Rural SBEEK Program resulted in a verified gross energy and peak demand savings of 1,997,182 kWh and 372 kW, respectively (not including kWh converted from gas savings). The verified gross realization rates for energy and peak demand savings were 75% and 99%, respectively. Verified net energy and peak demand savings were 1,797,464 kWh and 335 kW, respectively. The verified savings detailed in this section include PY9 Carryover savings.

The program includes seven types of measures as shown in the following tables. LED lamps contribute the most towards verified gross savings (44%), followed by all LED exit signs (29%) when considering electric savings only. LED bulbs and pre-rinse spray valves contributed the most to the verified gross savings (27% and 23%, respectively) after gas savings were converted to electric energy savings.

The evaluation team calculated custom ISRs using the participant telephone survey data provided by ComEd. All the other input parameters for the savings algorithms were from the appropriate C&I section of the IL TRM v6.0. The telephone survey was conducted by the program implementation contractor on a sample of program participants and the evaluation team reviewed the final summary results along with the survey questions

The custom ISR values the evaluation calculated from the survey responses are less than the values used in the ex ante calculations (where the ex ante calculations used deemed ISR values in the IL TRM), and the comparison of these values is detailed in Section 8 (Appendix 2) The discrepancies between the verified and ex ante observations in the tables below are due in large part to the use of custom ISR values and in part to using different building specific input variables.

**Table 5-1. CY2018 Energy Savings by Measure – Electric**

End Use Type	Research Category	Ex Ante Gross Savings (kWh)	Verified Gross Realization Rate	Verified Gross Savings (kWh)	NTG *	Verified Net Savings (kWh)	Effective Useful Life
Lighting	9.0-watt LED - Small Office	91,124	0.80	72,667	0.90	65,400	15.0
Lighting	9.0-watt LED - Restaurant	110,826	0.86	94,825	0.90	85,342	10.5
Lighting	9.0-watt LED - Other General	255,914	1.04	264,912	0.90	238,421	16.9
Lighting	BR30 LED - Other General	537,419	0.84	451,796	0.90	406,616	16.9
Lighting	Exit Sign LED - Small Office	320,550	0.31	97,878	0.90	88,090	16.0
Lighting	Exit Sign LED - Restaurant	159,161	0.38	59,828	0.90	53,845	16.0
Lighting	Exit Sign LED - Other General	797,395	0.53	422,861	0.90	380,575	16.0
Hot Water	Bathroom Aerator (1.0 GPM) - Small Office	13,062	0.54	7,063	0.90	6,357	9.0
Hot Water	Bathroom Aerator (1.0 GPM) - Restaurant	32,882	0.77	25,483	0.90	22,934	9.0
Hot Water	Bathroom Aerator (1.0 GPM) - Other General	32,494	0.64	20,937	0.90	18,843	9.0
Hot Water	Kitchen Aerator (1.5 GPM) -Small Office	7,582	0.57	4,305	0.90	3,874	9.0
Hot Water	Kitchen Aerator (1.5 GPM) -Restaurant	38,170	0.75	28,743	0.90	25,868	9.0
Hot Water	Pre-rinse Spray Valve- Restaurant	174,090	0.60	104,282	0.90	93,854	5.0
Consumer Electronics	Advanced Smart Strip- Tier 1 - Small Office	77,855	0.86	66,755	0.90	60,080	7.0
Carryover	PY9 Carryover	NR	NA	274,849	0.90	247,364	9.6
<b>Total</b>		<b>2,648,524</b>	<b>0.75</b>	<b>1,997,182</b>	<b>0.90</b>	<b>1,797,464</b>	

\* A deemed value. Source: ComEd\_NTG\_History\_and\_PY10\_Recommendations\_2017-03-01.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>.

NR = Not Reported

NA = Not Applicable

Source: ComEd tracking data and Navigant team analysis.

**Table 5-2. CY2018 Demand Savings by Measure**

End Use Type	Research Category	Ex Ante Gross Demand Reduction (kW)	Verified Gross Realization Rate	Verified Gross Demand Reduction (kW)	NTG *	Verified Net Demand Reduction (kW)
Lighting	9.0-watt LED - Small Office	NR	NA	28	0.90	25
Lighting	9.0-watt LED - Restaurant	NR	NA	22	0.90	20
Lighting	9.0-watt LED - Other General	NR	NA	105	0.90	94
Lighting	BR30 LED - Other General	NR	NA	179	0.90	161
Lighting	Exit Sign LED - Small Office	NR	NA	13	0.90	12
Lighting	Exit Sign LED - Restaurant	NR	NA	8	0.90	7
Lighting	Exit Sign LED - Other General	NR	NA	56	0.90	51
Hot Water	Bathroom Aerator (1.0 GPM) - Small Office	NR	NA	294	0.90	265
Hot Water	Bathroom Aerator (1.0 GPM) - Restaurant	NR	NA	207	0.90	186
Hot Water	Bathroom Aerator (1.0 GPM) - Other General	NR	NA	427	0.90	385
Hot Water	Kitchen Aerator (1.5 GPM) -Small Office	NR	NA	179	0.90	161
Hot Water	Kitchen Aerator (1.5 GPM) -Restaurant	NR	NA	234	0.90	210
Hot Water	Pre-rinse Spray Valve- Restaurant	NR	NA	0	0.90	0
Consumer Electronics	Advanced Smart Strip- Tier 1 - Small Office	NR	NA	1	0.90	1
Carryover	PY9 Carryover	NR	NA	105	0.90	95
<b>Total</b>				<b>1,858</b>	<b>0.90</b>	<b>1,672</b>

\* A deemed value. Source: ComEd\_NTG\_History\_and\_PY10\_Recommendations\_2017-03-01.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>.

NR = Not Reported

NA = Not Applicable

Source: ComEd tracking data and Navigant team analysis.

**Table 5-3. CY2018 Summer Peak Demand Savings by Measure**

End Use Type	Research Category	Ex Ante Gross Peak Demand Reduction (kW)	Verified Gross Realization Rate	Verified Gross Peak Demand Reduction (kW)	NTG*	Verified Net Peak Demand Reduction (kW)
Lighting	9.0-watt LED - Small Office	18	0.80	14	0.90	13
Lighting	9.0-watt LED - Restaurant	18	0.86	15	0.90	14
Lighting	9.0-watt LED - Other General	67	1.04	69	0.90	62
Lighting	BR30 LED - Other General	140	0.84	118	0.90	106
Lighting	Exit Sign LED - Small Office	28	0.47	13	0.90	12
Lighting	Exit Sign LED - Restaurant	14	0.55	8	0.90	7
Lighting	Exit Sign LED - Other General	70	0.80	56	0.90	51
Hot Water	Bathroom Aerator (1.0 GPM) - Small Office	3	0.54	2	0.90	2
Hot Water	Bathroom Aerator (1.0 GPM) - Restaurant	4	0.77	3	0.90	2
Hot Water	Bathroom Aerator (1.0 GPM) - Other General	8	0.64	5	0.90	5
Hot Water	Kitchen Aerator (1.5 GPM) -Small Office	2	0.57	1	0.90	1
Hot Water	Kitchen Aerator (1.5 GPM) -Restaurant	4	0.75	3	0.90	3
Hot Water	Pre-rinse Spray Valve- Restaurant	0	NA	0	0.90	0
Consumer Electronics	Advanced Smart Strip- Tier 1 - Small Office	0	NA	0	0.90	0
Carryover	PY9 Carryover	NR	NA	64	0.90	57
<b>Total</b>		<b>377</b>	<b>0.99</b>	<b>372</b>	<b>0.90</b>	<b>335</b>

\* A deemed value. Source: ComEd\_NTG\_History\_and\_PY10\_Recommendations\_2017-03-01.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>.

NR = Not Reported

NA = Not Applicable

Source: ComEd tracking data and Navigant team analysis.

**Table 5-4. CY2018 Energy Savings by Measure – Gas**

End Use Type	Research Category	Ex Ante Gross Savings	Verified Gross Realization Rate	Verified Gross Savings	NTG *	Verified Net Savings	Effective Useful Life
Lighting	9.0-watt LED - Small Office	NA	NA	NA	0.90	NA	15.0
Lighting	9.0-watt LED - Restaurant	NA	NA	NA	0.90	NA	10.5
Lighting	9.0-watt LED - Other General	NA	NA	NA	0.90	NA	16.9
Lighting	BR30 LED - Other General	NA	NA	NA	0.90	NA	16.9
Lighting	Exit Sign LED - Small Office	NA	NA	NA	0.90	NA	16.0
Lighting	Exit Sign LED - Restaurant	NA	NA	NA	0.90	NA	16.0
Lighting	Exit Sign LED - Other General	NA	NA	NA	0.90	NA	16.0
Hot Water	Bathroom Aerator (1.0 GPM) - Small Office	3,536	0.52	1,852	0.90	1,667	9.0
Hot Water	Bathroom Aerator (1.0 GPM) - Restaurant	8,628	0.77	6,681	0.90	6,013	9.0
Hot Water	Bathroom Aerator (1.0 GPM) - Other General	15,180	0.36	5,489	0.90	4,940	9.0
Hot Water	Kitchen Aerator (1.5 GPM) -Small Office	2,566	0.44	1,129	0.90	1,016	9.0
Hot Water	Kitchen Aerator (1.5 GPM) -Restaurant	10,518	0.72	7,537	0.90	6,783	9.0
Hot Water	Pre-rinse Spray Valve- Restaurant	57,354	0.40	22,656	0.90	20,391	5.0
Consumer Electronics	Advanced Smart Strip- Tier 1 - Small Office	0	NA	0	0.90	0	7.0
Carryover	PY9 Carryover	NR	NA	0	0.90	0	9.6
<b>Total Therms</b>		<b>97,783</b>	<b>0.46</b>	<b>45,344</b>	<b>0.90</b>	<b>40,809</b>	
<b>Total kWh Converted From Therms†</b>		<b>2,866,012</b>		<b>1,329,026</b>		<b>1,196,123</b>	

\* A deemed value. Source: ComEd\_NTG\_History\_and\_PY10\_Recommendations\_2017-03-01.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>.

† Gas savings converted to kWh by multiplying therms \* 29.31 (which is based on 100,000 Btu/therm and 3,412 Btu/kWh).

NR = Not Reported

NA = Not Applicable

Source: ComEd tracking data and Navigant team analysis.



**Table 5-5. CY2018 Energy Savings by Measure – Total Combining Electricity and Gas**

End Use Type	Research Category	Ex Ante Gross Savings (kWh)	Verified Gross Realization Rate	Verified Gross Savings (kWh)	NTG *	Verified Net Savings (kWh)
Lighting	9.0-watt LED - Small Office	91,124	0.80	72,667	0.90	65,400
Lighting	9.0-watt LED - Restaurant	110,826	0.86	94,825	0.90	85,342
Lighting	9.0-watt LED - Other General	255,914	1.04	264,912	0.90	238,421
Lighting	BR30 LED - Other General	537,419	0.84	451,796	0.90	406,616
Lighting	Exit Sign LED - Small Office	320,550	0.31	97,878	0.90	88,090
Lighting	Exit Sign LED - Restaurant	159,161	0.38	59,828	0.90	53,845
Lighting	Exit Sign LED - Other General	797,395	0.53	422,861	0.90	380,575
Hot Water	Bathroom Aerator (1.0 GPM) - Small Office	116,710	0.53	61,339	0.90	55,205
Hot Water	Bathroom Aerator (1.0 GPM) - Restaurant	285,759	0.77	221,296	0.90	199,167
Hot Water	Bathroom Aerator (1.0 GPM) - Other General	477,429	0.38	181,820	0.90	163,638
Hot Water	Kitchen Aerator (1.5 GPM) -Small Office	82,796	0.45	37,389	0.90	33,650
Hot Water	Kitchen Aerator (1.5 GPM) -Restaurant	346,464	0.72	249,656	0.90	224,690
Hot Water	Pre-rinse Spray Valve- Restaurant	1,855,134	0.41	768,338	0.90	691,504
Consumer Electronics	Advanced Smart.Strip- Tier 1 - Small Office	77,855	0.86	66,755	0.90	60,080
Carryover	PY9 Carryover	NR	NA	274,849	0.90	247,364
<b>Total†</b>		<b>5,514,536</b>	<b>0.60</b>	<b>3,326,208</b>	<b>0.90</b>	<b>2,993,587</b>

\* A deemed value. Source: ComEd\_NTG\_History\_and\_PY10\_Recommendations\_2017-03-01.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>.

† The total includes the electric equivalent of the total therms.

NR = Not Reported

NA = Not Applicable

Source: ComEd tracking data and Navigant team analysis.

## 6. IMPACT ANALYSIS FINDINGS AND RECOMMENDATIONS

### 6.1 Impact Parameter Estimates

Table 6-1 details all the custom and deemed inputs used for calculating the energy and demand savings for each measure, as well as their source. The evaluation team calculated savings for each measure based on the savings algorithms noted in the IL TRM v6.0 or each respective measure. The custom inputs were calculated using the telephone participant survey data supplied by the implementer.

**Table 6-1. Savings Parameters**

Measure	Custom Input Parameters	Deemed Input Parameters	Deemed* Input Data Source
9W LEDs	WattsEE, ISR	Wattbase, Hours, WHFe, WHFd, CF, NTG <sup>†</sup>	IL TRM v6.0 – Section 4.5.4
BR30 8W LEDs	WattsEE, ISR	Wattbase, Hours, WHFe, WHFd, CF, NTG <sup>†</sup>	IL TRM v6.0 – Section 4.5.4
Exit Signs	WattsEE, ISR	Wattbase, Hours, WHFe, WHFd, CF, NTG <sup>†</sup>	IL TRM v6.0 – Section 4.5.5
Bathroom Aerators	ISR, Usage	GPM_base, GPM_low, EPG_electric, CF, Hours, NTG <sup>†</sup>	IL TRM v6.0 – Section 4.3.2
Kitchen Aerators	ISR, Usage	GPM_base, GPM_low, EPG_electric, CF, Hours, NTG <sup>†</sup>	IL TRM v6.0 – Section 4.3.3
Pre-Rinse Spray Valves	ISR, FLOee	Tout, Tin, EEf_Elec, FLObase, HOURSDay, DAYYear, NTG <sup>†</sup>	IL TRM v6.0 – Section 4.2.11
Advanced Power Strips	ISR	Verified Gross kWh, Hours, CF, NTG <sup>†</sup>	IL TRM v6.0 – Section 4.8.7

\* State of Illinois Technical Reference Manual version 6.0 from <http://www.ilsag.info/technical-reference-manual.html>.

† A deemed value. Source: ComEd\_NTG\_History\_and\_PY10\_Recommendations\_2017-03-01.xlsx, which is to be found on the IL SAG web site here: <http://ilsag.info/net-to-gross-framework.html>.

## 6.2 CY2019 Carryover Savings Estimate

Calculation of the CY2019 carryover estimate relies upon the IL TRM v7.0 and the PY9 and CY2018 reports. At this time, all of these data sources are available and thus it is possible to estimate the gross and net carryover energy savings that the evaluation team recommends for CY2019. The energy and demand savings from these PY9 and CY2018 late installed bulbs are calculated based on the following parameters:

- Delta Watts – Verified savings estimate from the year of installation (source: IL TRM v7.0, CY2018 program data).
- HOU and Peak CF – Verified savings estimate from the year of installation (source: IL TRM v7.0).
- Energy and Demand IE – Verified savings estimate from the year of installation (source: IL TRM v7.0.)
- Installation Rate - Verified savings estimate from the year of purchase (CY2018 program survey data). The Navigant team subtracted the CY2018 custom ISR from the lifetime ISR found in the IL TRM v6.0, and split the remaining installs between the second and third years using the same ratio found in the IL TRM v6.0.
- NTG – Evaluation research from the year of purchase (source: PY9 and CY2018 Reports).

Table 6-2 shows that 4,662 bulbs were purchased during either PY9 or CY2018 and are expected to be installed within ComEd service territory. The table provides both the gross and net energy and demand savings from these bulbs. The total net energy and summer peak demand savings are estimated to be 461,067 kWh and 109.61 kW, which will be counted in CY2019 Rural SBEEK program carryover savings.

**Table 6-2. CY2019 Verified Savings Carryover Estimate**

CY2019 Verified Savings Carryover Estimate	PY9 Bulbs	CY2018 Bulbs	CY2019 Carryover
Carryover Bulbs Installed During CY2019	2,265	2,397	4,662
Average Delta Watts	30.6	28.1	29.3
Average Installation Rate	1.00	1.00	1.00
Average Annual Hours of Use	3,086	3,177	3,133
Energy Interactive Effects	1.12	1.26	1.19
Demand Interactive Effects	1.30	1.47	1.39
Summer Peak Load Coincidence Factor	0.59	0.64	0.62
Carryover Gross Energy Savings (kWh)	235,585	276,712	512,297
Carryover Gross Demand Savings (kW)	90.02	103.76	193.78
Carryover Gross Summer Peak Demand Savings (kW)	54.74	67.04	121.79
Net-to-Gross Ratio	0.90	0.90	0.90
Carryover Net Energy Savings (kWh)	212,026	249,041	461,067
Carryover Net Demand Savings (kW)	81.02	93.39	174.40
Carryover Net Summer Peak Demand Savings (kW)	49.27	60.34	109.61
Effective Useful Life	7.8	14.9	11.5

Source: ComEd Tracking Data and Navigant team analysis

## 6.3 Other Impact Findings and Recommendations

The evaluation team developed several recommendations based on findings from the CY2018 evaluation. Findings and recommendations for each measure included in the kits are listed below.

### 6.3.1 Program Level

**Finding 1.** The ex ante savings claimed for the Rural SBEEK Program did not include carryover savings from PY9.

**Recommendation 1.** The evaluation team recommends tracking carryover savings on an ongoing basis and including carryover savings estimates in the ex ante energy and demand savings.

**Finding 2.** The evaluation team found that CY2018 telephone survey respondents indicated lower installation rates compared to PY9 telephone survey respondents. Table 6-3 shows a comparison of the installation rates determined from the participant survey data in PY9 and CY2018. Most measures show notable decreases in the reported ISRs across all three kit types.

**Table 6-3. ISR Comparison from PY9 to CY2018**

Measure	PY9 ISR			CY2018 ISR			Change (CY2018-PY9)		
	Small Office	Restaurant	Other / General	Small Office	Restaurant	Other / General	Small Office	Restaurant	Other / General
LED 9W	75%	86%	87%	53%	56%	68%	-22%	-30%	-19%
BR30 LED 8 W	NA	NA	49%	NA	NA	55%	NA	NA	6%
Exit Sign*	NA	NA	NA	24%	28%	35%	NA	NA	NA
Bath Aerator - Low Flow	41%	82%	69%	34%	49%	41%	-7%	-33%	-28%
Kitchen Aerator - Low Flow	39%	82%	NA	34%	45%	NA	-5%	-36%	NA
Pre-rinse Spray Valve	0%	83%	NA	0%	40%	NA	0%	-43%	NA
Advanced Smart Strip - Tier 1	77%	NA	NA	59%	NA	NA	-18%	NA	NA

Note that PY9 kits did not include exit signs  
NA = Not Applicable

Source: ComEd program data and Navigant team analysis

The Navigant team conducted a comparison between the PY9 and CY2018 participant lists to determine if customers were receiving kits in back-to-back years. Customers who received a kit in PY9 may be less likely to install measures they received in the CY2018 kit. The Navigant team’s analysis showed that 18 percent of customers who received a kit in CY2018 were likely to have received a kit during PY9.

**Table 6-4. PY9 and CY2018 Repeat Customer Summary**

Kit Type	PY9 Quantity	CY2018 Quantity	Repeat Customers	Repeat Customers (percent of CY2018)*
General Kit†	1,162	2,505	423	17%
Office Kit	4,181	1,007	202	20%
Restaurant Kit‡	665	500	86	17%
<b>Total</b>	<b>6,008</b>	<b>4,012</b>	<b>711</b>	<b>18%</b>

\*Repeat customers were those where the telephone number, service address, full company name, or any combination of those three fields was the same in both program years

† In CY2018 the general kit replaced the retail kit

‡ CY2018 restaurant kit includes sit-down and fast-food kits from PY9

Source: ComEd program data and Navigant team analysis

**Recommendation 2.** The evaluation team recommends screening out previous program participants. Removing customers who already received kits from previous years may increase the ISR for kit measures.

### 6.3.2 9W LEDs and 8W BR30 LEDs

**Finding 3.** The ex ante calculations used the ISR values deemed by the IL TRM v6.0 for the LED lamp measures where the evaluation team calculated a custom ISR based on participant survey response data provided by the implementer. The ex ante savings calculations used an ISR value of 0.66 while the verified calculation used custom ISR values for each kit type (0.53 for office LEDs, 0.57 for restaurant LEDs, 0.68 for other/general LEDs, and 0.56 for other/general BR30LEDs) causing the verified savings for these measures to be less than the ex ante savings.

**Recommendation 3.** The evaluation team recommends calculating custom ISR values for measures when sufficient participant survey response data is available.

### 6.3.3 LED Exit Signs

**Finding 4.** The ex ante calculations use CF, WHFe, and WHFd factors for a Low-Use Small Business building type to calculate the energy and demand savings for the LED exit signs in the office and restaurant kits. The verified analysis used values for CF, WHFe, and WHFd specific to small office and restaurant building types to calculate the respective energy and demand savings. This finding reduced the ex ante savings for the LED exit signs installed in small offices and restaurants.

**Recommendation 4.** The evaluation team recommends using input variables that correspond to the applicable TRM building type when calculating energy and demand savings.

**Finding 5.** The ex ante calculations used the ISR values deemed by the IL TRM v6.0 for the LED exit sign measures where the evaluation team calculated a custom ISR based on participant survey response data provided by the implementer. The ex ante savings calculations used an ISR value of 0.66 while the verified calculation used custom ISR values for each kit type (0.28 for restaurant exit signs, 0.24 for small office exit signs, 0.35 for other/general LED exit signs). This finding caused the verified savings for this measure to be less than the ex ante savings.

**Recommendation 5.** The evaluation team recommends calculating custom ISR values for measures when sufficient participant survey response data is available.

### 6.3.4 Bathroom and Kitchen Low Flow Faucet Aerators

**Finding 6.** The ex ante calculations used the ISR values deemed by the IL TRM v6.0 for the bathroom and kitchen faucet aerator measures where the evaluation team calculated a custom ISR based on participant survey response data provided by the implementer. The ex ante savings calculations used an ISR value of 0.63 for the bathroom faucet aerators and an ISR value of 0.60 for the kitchen faucet aerators while the verified calculation used custom ISR values for each kit type. This finding caused the verified savings for this measure to be less than the ex ante savings.

**Recommendation 6.** The evaluation team recommends calculating custom ISR values for measures when sufficient participant survey response data is available.

**Finding 7.** The ex ante gas calculations used different inputs than the ex ante calculations for energy and demand savings. The bathroom aerator savings for other/general kits used an ISR of 0.95 and 100 percent electric water heaters, from measure 4.3.2 in the IL TRM v6.0.

**Recommendation 7.** The evaluation team recommends calculating natural gas savings using the same ISR (from participant survey data) and percent electric hot water heaters (0.16 from the IL TRM) as other aerator savings calculations.

### 6.3.5 High Efficiency Pre-Rinse Spray Valves

**Finding 8.** The ex ante gas savings are calculated using a gas water heater efficiency of 75 percent but did not provide a reference for this value in the calculations. The evaluation team used the value stipulated in the IL TRM v6.0 (80 percent) when a custom efficiency value is not known.

**Recommendation 8.** The evaluation team encourages the implementer to use custom values when permitted in the IL TRM to calculate savings and requests the implementer supply supporting documentation so the assumptions and can be independently reviewed. The implementer did not provide documentation to support the use of a 75% gas water heater efficiency, therefore, the evaluation team used the deemed 80% gas water heater efficiency noted in the IL TRM v6.0.

**Finding 9.** The ex ante calculations used the ISR values deemed by the IL TRM v6.0 for the pre-rinse spray valve measure where the evaluation team calculated a custom ISR based on participant survey response data provided by the implementer. The ex ante savings calculations used an ISR value of 0.66 while the verified calculation used custom ISR value of 0.40. This finding caused the verified savings for this measure to be less than the ex ante savings.

**Recommendation 9.** The evaluation team recommends calculating custom ISR values for measures when sufficient participant survey response data is available.

**Finding 10.** The ex ante gas calculations used different inputs than the ex ante calculations for energy and demand savings. The ex ante gas calculations used an ISR of 1.0.

**Recommendation 10.** The evaluation team recommends calculating the gas savings using the same ISR as the energy and demand savings.

### 6.3.6 Advanced Power Strip – Tier 1

**Finding 11.** The ex ante calculations used the ISR values deemed by the IL TRM v6.0 for the advanced power strip measure where the evaluation team calculated a custom ISR based on participant survey response data provided by the implementer. The ex ante savings calculations used an ISR value of 0.69 while the verified calculation used custom ISR value of 0.59. This finding caused the verified savings for this measure to be less than the ex ante savings.

**Recommendation 11.** The evaluation team recommends calculating custom ISR values for measures when sufficient participant survey response data is available.

## 7. APPENDIX 1. IMPACT ANALYSIS METHODOLOGY

The evaluation team utilized the appropriate input parameters and equations found in the IL TRM v6.0. The evaluation team used the deemed input parameters from all measures except for specifications of the items included in the kit, and ISRs or usage parameters taken from survey data. A detailed summary of the input parameters used is found in Section 8 (Appendix 2).

## 8. APPENDIX 2. IMPACT ANALYSIS DETAIL

The tables below show the comparison between the inputs assumptions that were used by the evaluation team and the implementation contractor in the ex ante and verified calculations for each measure.

**Table 8-1. LED Custom and Deemed Values Comparison**

Value, Navigant	Value, Implementer	Variable	Source	Deemed / Custom	Discrepancy
<b>9W LED Office</b>					
29	29	Wattsbase	IL TRM 4.5.4	Deemed	
9	9	WattsEE	Specifications	Actual	
0.53	0.66	ISR	Survey	Custom	Yes
3,088	3,088	Hours	IL TRM 4.5.4	Deemed	
1.11	1.11	WHFe	IL TRM 4.5.4	Deemed	
1.31	1.31	WHFd	IL TRM 4.5.4	Deemed	
0.52	0.52	CF	IL TRM 4.5.4	Deemed	
0.016	0.016	IFTtherms	IL TRM 4.5.4	Deemed	
<b>9W LED Restaurant</b>					
29	29	Wattsbase	IL TRM 4.5.4	Deemed	
9	9	WattsEE	Specifications	Actual	
0.57	0.66	ISR	Survey	Custom	Yes
4,784	4,784	Hours	IL TRM 4.5.4	Deemed	
1.17	1.17	WHFe	IL TRM 4.5.4	Deemed	
1.31	1.31	WHFd	IL TRM 4.5.4	Deemed	
0.68	0.68	CF	IL TRM 4.5.4	Deemed	
0.021	0.021	IFTtherms	IL TRM 4.5.4	Deemed	
<b>9W LED Low-Use Small Business</b>					
29	29	Wattsbase	IL TRM 4.5.4	Deemed	
9	9	WattsEE	Specifications	Actual	
0.68	0.66	ISR	Survey	Custom	Yes
2,954	2,954	Hours	IL TRM 4.5.4	Deemed	
1.31	1.31	WHFe	IL TRM 4.5.4	Deemed	
1.53	1.53	WHFd	IL TRM 4.5.4	Deemed	
0.66	0.66	CF	IL TRM 4.5.4	Deemed	
0.023	0.023	IFTtherms	IL TRM 4.5.4	Deemed	
<b>8W BR30 LEDs Low-Use Small Business</b>					
50	50	Wattsbase	IL TRM 4.5.4	Deemed	
8	8	WattsEE	Specifications	Actual	
0.56	0.66	ISR	Survey	Custom	Yes
2,954	2,954	Hours	IL TRM 4.5.4	Deemed	
1.31	1.31	WHFe	IL TRM 4.5.4	Deemed	
1.53	1.53	WHFd	IL TRM 4.5.4	Deemed	
0.66	0.66	CF	IL TRM 4.5.4	Deemed	
0.023	0.023	IFTtherms	IL TRM 4.5.4	Deemed	

Source: ComEd tracking data and Navigant team analysis.

**Table 8-2. Exit Sign Custom and Deemed Values Comparison**

Value, Navigant	Value, Implementer	Variable	Source	Deemed / Custom	Discrepancy
<b>Office</b>					
23	23	Wattsbase	IL TRM 4.5.5	Deemed	
2	2	WattsEE	Specifications	Actual	
0.24	0.66	ISR	Survey	Custom	Yes
8766	8766	Hours	IL TRM 4.5.5	Deemed	
1.11	1.31	WHFe	IL TRM 4.5.5	Deemed	Yes
1.31	1.53	WHFd	IL TRM 4.5.5	Deemed	Yes
1.00	0.66	CF	IL TRM 4.5.5	Deemed	Yes
<b>Restaurant</b>					
23	23	Wattsbase	IL TRM 4.5.5	Deemed	
2	2	WattsEE	Specifications	Actual	
0.28	0.66	ISR	Survey	Custom	Yes
8766	8766	Hours	IL TRM 4.5.5	Deemed	
1.17	1.31	WHFe	IL TRM 4.5.5	Deemed	Yes
1.31	1.53	WHFd	IL TRM 4.5.5	Deemed	Yes
1.00	0.66	CF	IL TRM 4.5.5	Deemed	Yes
<b>Low-Use Small Business</b>					
23	23	Wattsbase	IL TRM 4.5.5	Deemed	
2	2	WattsEE	Specifications	Actual	
0.35	0.66	ISR	Survey	Custom	Yes
8766	8766	Hours	IL TRM 4.5.5	Deemed	
1.31	1.31	WHFe	IL TRM 4.5.5	Deemed	
1.53	1.53	WHFd	IL TRM 4.5.5	Deemed	
1.0	0.66	CF	IL TRM 4.5.5	Deemed	Yes



**Table 8-3. Bathroom Faucet Aerator Custom and Deemed Values Comparison**

Value, Navigant	Value, Implementer	Variable	Source	Deemed / Custom	Discrepancy
<b>Bathroom Faucet Aerator Office</b>					
0.16	0.16	%Electric DHW	IL TRM 4.3.1	Deemed	
0.84	0.84	%FossilDHW	IL TRM 4.3.1	Deemed	
1.39	1.39	GPM_base	IL TRM 4.3.1	Deemed	
0.94	0.94	GPM_low	IL TRM 4.3.1	Deemed	
2,500	2,500	Usage	IL TRM 4.3.1	Deemed	
0.0795	0.0795	EPG_electric	IL TRM 4.3.1	Deemed	
0.00397	0.00397	EPG_gas	IL TRM 4.3.1	Deemed	
0.34	0.63	ISR	Survey	Custom	Yes
0.0064	0.0064	CF	IL TRM 4.3.1	Deemed	
24	24	Hours	IL TRM 4.3.1	Deemed	
<b>Bathroom Faucet Aerator Restaurant</b>					
0.16	0.16	%Electric DHW	IL TRM 4.3.1	Deemed	
0.84	0.84	%FossilDHW	IL TRM 4.3.1	Deemed	
1.39	1.39	GPM_base	IL TRM 4.3.1	Deemed	
0.94	0.94	GPM_low	IL TRM 4.3.1	Deemed	
12,675	12,675	Usage	IL TRM 4.3.1	Deemed	
0.0795	0.0795	EPG_electric	IL TRM 4.3.1	Deemed	
0.00397	0.00397	EPG_gas	IL TRM 4.3.1	Deemed	
0.49	0.63	ISR	Survey	Custom	Yes
0.0134	0.0134	CF	IL TRM 4.3.1	Deemed	
123	123	Hours	IL TRM 4.3.1	Deemed	
<b>Bathroom Faucet Aerator Low-use Small Business</b>					
0.16	0.16	%Electric DHW	IL TRM 4.3.2	Deemed	
0.84	0.84	%FossilDHW	IL TRM 4.3.2	Deemed	
1.39	1.39	GPM_base	IL TRM 4.3.2	Deemed	
0.94	0.94	GPM_low	IL TRM 4.3.2	Deemed	
5,000	5,000	Usage	IL TRM 4.3.2	Deemed	
0.0795	0.0795	EPG_electric	IL TRM 4.3.2	Deemed	
0.00397	0.00397	EPG_gas	IL TRM 4.3.2	Deemed	
0.41	0.63	ISR	Survey	Custom	Yes
0.0128	0.0128	CF	IL TRM 4.3.2	Deemed	
49	49	Hours	IL TRM 4.3.2	Deemed	

Source: ComEd tracking data and Navigant team analysis.

**Table 8-4. Kitchen Faucet Aerator Custom and Deemed Values Comparison**

Value, Navigant	Value, Implementer	Variable	Source	Deemed / Custom	Discrepancy
<b>Kitchen Faucet Aerator Office</b>					
0.16	0.16	%Electric DHW	IL TRM 4.3.2	Deemed	
0.84	0.84	%FossilDHW	IL TRM 4.3.2	Deemed	
1.39	1.39	GPM_base	IL TRM 4.3.2	Deemed	
0.94	0.94	GPM_low	IL TRM 4.3.2	Deemed	
2,500	2,500	Usage	IL TRM 4.3.2	Deemed	
0.0969	0.0969	EPG_electric	IL TRM 4.3.2	Deemed	
0.00484	0.00484	EPG_gas	IL TRM 4.3.2	Deemed	
0.34	0.60	ISR	Survey	Custom	Yes
0.0064	0.0064	CF	IL TRM 4.3.2	Deemed	
24	24	Hours	IL TRM 4.3.2	Deemed	
<b>Kitchen Faucet Aerator Restaurant</b>					
0.16	0.16	%Electric DHW	IL TRM 4.3.2	Deemed	
0.84	0.84	%FossilDHW	IL TRM 4.3.2	Deemed	
1.39	1.39	GPM_base	IL TRM 4.3.2	Deemed	
0.94	0.94	GPM_low	IL TRM 4.3.2	Deemed	
12,675	12,675	Usage	IL TRM 4.3.2	Deemed	
0.0969	0.0969	EPG_electric	IL TRM 4.3.2	Deemed	
0.00484	0.00484	EPG_gas	IL TRM 4.3.2	Deemed	
0.45	0.60	ISR	Survey	Custom	Yes
0.0134	0.0134	CF	IL TRM 4.3.2	Deemed	
123	123	Hours	IL TRM 4.3.2	Deemed	

Source: ComEd tracking data and Navigant team analysis.

**Table 8-5. High-efficiency Pre-Rinse Spray Valves Custom and Deemed Values Comparison**

Value, Navigant	Value, Implementer	Variable	Source	Deemed / Custom	Discrepancy
0.16	0.16	%Electric DHW	IL TRM 4.2.11	Deemed	
0.84	0.84	%FossilDHW	IL TRM 4.2.11	Deemed	
124.1	124.1	Tout	IL TRM 4.2.11	Deemed	
54.1	54.1	Tin	IL TRM 4.2.11	Deemed	
0.97	0.97	EFF_Elec	IL TRM 4.2.11	Deemed	
0.8	0.8	EFF_Gas	IL TRM 4.2.11	Deemed	
1.9	1.9	FLObase	IL TRM 4.2.11	Deemed	
1.1	1.1	FLOee	Specifications	Actual	
1.25	1.25	HOURSday	IL TRM 4.2.11	Deemed	
312	312	DAYSyear	IL TRM 4.2.11	Deemed	
1	1	FLAG	IL TRM 4.2.11	Deemed	
0.40	0.66	ISR	Survey	Custom	Yes

Source: ComEd tracking data and Navigant team analysis.

**Table 8-6. Advanced Power Strip – Tier 1 Custom and Deemed Values Comparison**

Value, Navigant	Value, Implementer	Variable	Source	Deemed / Custom	Discrepancy
0.0315	0.0315	K_wkday	IL TRM 4.8.7	Deemed	
0.00617	0.00617	KW_wkend	IL TRM 4.8.7	Deemed	
106	106	Hrs_wkay	IL TRM 4.8.7	Deemed	
62	62	Hrs_wkend	IL TRM 4.8.7	Deemed	
50	50	Hrs_wkday-open	IL TRM 4.8.7	Deemed	
0	0	Hrs_wkend-open	IL TRM 4.8.7	Deemed	
52.2	52.2	Weeks per year	IL TRM 4.8.7	Deemed	
0.59	0.69	ISR	Survey	Custom	Yes

Source: ComEd tracking data and Navigant team analysis.

## 9. APPENDIX 3. TOTAL RESOURCE COST DETAIL

Table 9-1 below, shows the Total Resource Cost (TRC) table. It includes only the cost-effectiveness analysis inputs available at the time of finalizing this impact evaluation report. Additional required cost data (e.g., measure costs, program level incentive and non-incentive costs) are not included in this table and will be provided to evaluation later.

**Table 9-1. Total Resource Cost Savings Summary**

End Use Type	Research Category	Units	Quantity	Effective Useful Life	Ex Ante Gross Savings (kWh)	Ex Ante Gross Peak Demand Reduction (kW)	Verified Gross Savings (kWh)	Verified Gross Peak Demand Reduction (kW)
Lighting	9.0-watt LED - Small Office	Lamp	2,014	15.0	91,124	18	72,667	14
Lighting	9.0-watt LED - Restaurant	Lamp	1,500	10.5	110,826	18	94,825	15
Lighting	9.0-watt LED - Other General	Lamp	5,010	16.9	255,914	67	264,912	69
Lighting	BR30 LED - Other General	Lamp	5,010	16.9	537,419	140	451,796	118
Lighting	Exit Sign LED - Small Office	Each	2,014	16.0	320,550	28	97,878	13
Lighting	Exit Sign LED - Restaurant	Each	1,000	16.0	159,161	14	59,828	8
Lighting	Exit Sign LED - Other General	Each	5,010	16.0	797,395	70	422,861	56
Hot Water	Bathroom Aerator (1.0 GPM) - Small Office	Each	2,014	9.0	13,062	3	7,063	2
Hot Water	Bathroom Aerator (1.0 GPM) - Restaurant	Each	1,000	9.0	32,882	4	25,483	3
Hot Water	Bathroom Aerator (1.0 GPM) - Other General	Each	2,505	9.0	32,494	8	20,937	5
Hot Water	Kitchen Aerator (1.5 GPM) -Small Office	Each	1,007	9.0	7,582	2	4,305	1
Hot Water	Kitchen Aerator (1.5 GPM) -Restaurant	Each	1,000	9.0	38,170	4	28,743	3
Hot Water	Pre-rinse Spray Valve- Restaurant	Each	500	5.0	174,090	0	104,282	0
Consumer Electronics	Advanced Smart Strip- Tier 1 - Small Office	Each	1,007	7.0	77,855	NR	66,755	0
Carryover	PY9 Carryover			9.6	NR	NR	274,849	64

Source: ComEd tracking data and Navigant team analysis.